

WHAT IS CLAIMED IS:

1. An integrated circuit, comprising:
 - (a) a substrate;
 - (b) a dielectric layer disposed on the substrate and having a trench disposed therein;
 - (c) a conductor disposed within the trench; and
 - (d) a substantially impermeable barrier, including at least two different materials bonded together and expanded, located between the conductor and the dielectric layer.
- 10 2. The integrated circuit of Claim 1 wherein one of the materials includes palladium.
3. The integrated circuit of Claim 1 wherein one of the materials includes platinum.
4. The integrated circuit of Claim 1 wherein the barrier further includes silicon.
5. The integrated circuit of Claim 1 wherein the conductor includes copper.
- 15 6. The integrated circuit of Claim 1 wherein the barrier has a thickness between about 2 nm to about 200 nm.
7. An integrated circuit comprising:
 - (a) a conductor disposed on a substrate; and
 - (b) a substantially impermeable barrier encapsulating at least a top surface and side surfaces of the conductor.

8. The integrated circuit of Claim 7 further comprising an insulator adjacent to at least a portion of the barrier.
9. The integrated circuit of Claim 7 wherein the barrier includes CoWB.
10. The integrated circuit of Claim 7 wherein the barrier includes CoWP.

5 11. The integrated circuit of Claim 7 wherein the barrier includes CoWB(p).

12. The integrated circuit of Claim 7 wherein the barrier has a thickness between about 2 nm to about 200 nm.
13. The integrated circuit of Claim 7 wherein the conductor includes copper.
14. The integrated circuit of Claim 7 wherein the substantially impermeable barrier
10 also encapsulates at least a portion of a bottom surface of the conductor.